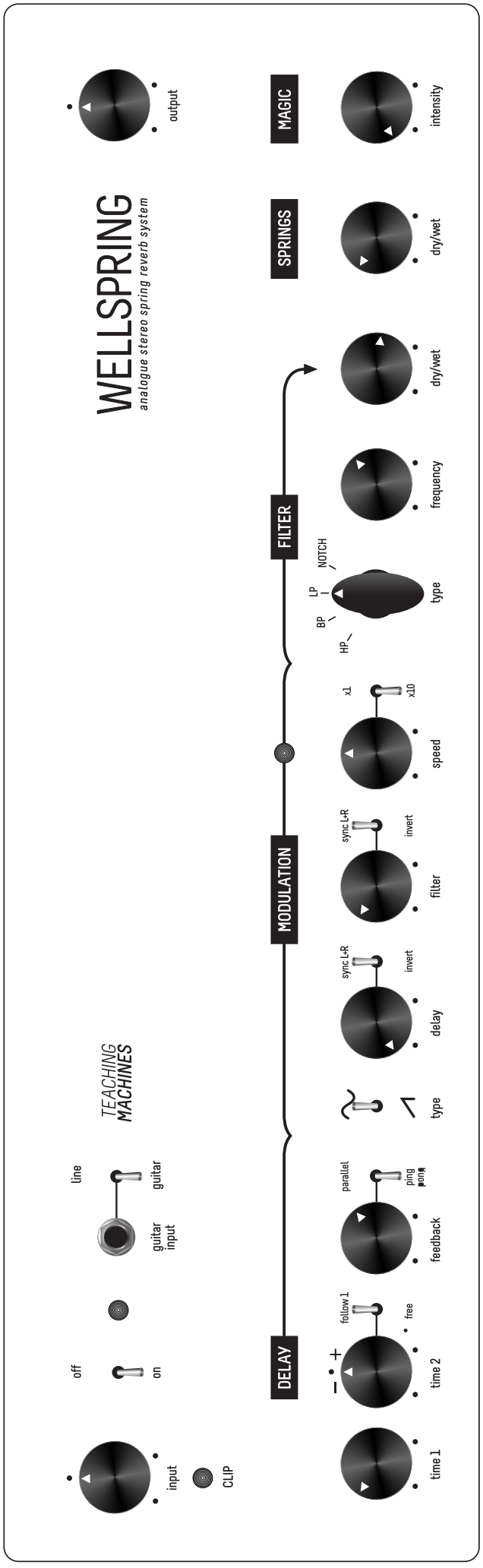
WELLSPRING

analogue stereo spring reverb system

Operation Manual

The Wellspring is an incredibly powerful stereo analogue reverb system designed to allow the creation of long and complex ‘tails’ with an authentic natural tone

TEACHING MACHINES



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INTRODUCTION

Many thanks for buying the Wellspring reverb system.

Our packaging is made from 100% biodegradable/recycled/recyclable materials. You can buy from us with confidence that we're a small part of the solution and not part of the problem (much). Although the Wellspring is made with single use electronic components, it's well built and we expect it to literally last a lifetime (30yrs+ easily). We offer a five year warranty against electronic or mechanical defects, after which time we will still fix it for a small fee.

WHY?

We really love reverb and we noticed a distinct lack of stereo spring reverbs on the market. Sensing an opportunity, we wanted to build one. Adding some complimentary controls that would enable the easy creation of long, natural reverb tails seemed to make sense. We decided that some analogue delays, filters, feedback and modulation were needed. It took a while (this is our first product after all) but we finally developed the Wellspring.

Wellspring - (wĕl'sprĭng) n.
1, the source of a stream, spring, etc. fountainhead.
2, a source of abundant and continual supply.

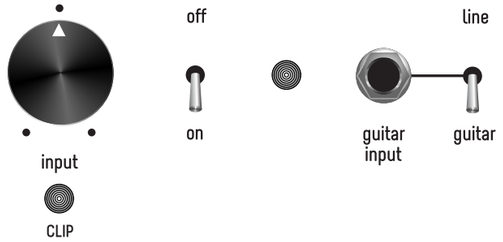
GENERALLY

This 'analogue marriage' of Stereo Reverb to Stereo Delay (with Modulation, Filter and Feedback control) provides endless tweaking possibilities.

When adding delay to reverb there is a danger of creating 'ringing tones'. These can be minimised and 'scattered' by dialing some modulation into the signal path. A broad range of modulation speeds can be attained. From very long and slow up to 'oscillator' speeds, allowing many sound sculpting possibilities. There are also stereo modulation switching options that allow the creation of some really interesting wide textures and effects.

The Wellspring is a versatile machine with a serious sound that is a lot of fun to use.

INPUT/OUTPUT



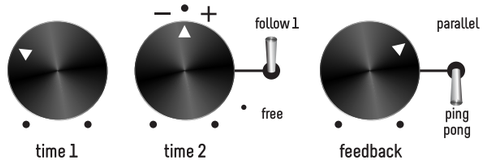
The main power switch is to the right of the **INPUT** knob and has a green indicator light to it's right.

The **INPUT** knob controls the level of the audio signal you are feeding into the unit either via the **LINE** or **GUITAR** input jacks. There is a red **CLIP** light below the knob to indicate if the input signal is too high. This is not necessarily a bad thing as the unit is designed to distort in a pleasing way.

To the right of the power light is the mono **GUITAR** input socket (which is sent to both channels). It is a high impedance input which means you can plug in and get a great guitar sound straight away (no amp needed). The attached selector switch to the right of that switches between the front **GUITAR** input and the rear **LINE** inputs, don't forget.

The **OUTPUT** knob controls the overall volume of the unit. Unity gain is the top centre of the control but some extra gain is available if needed by turning it further. The **OUTPUT** sockets are at the rear and dealt with later in the manual.

DELAY SECTION



TIME 1 controls the delay time of the left/mono signal.

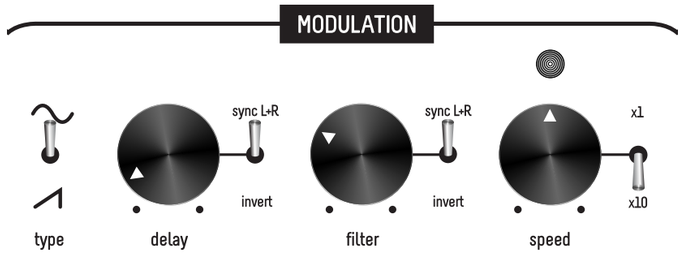
TIME 2 controls the delay time of the right signal when the attached switch is in the downward **FREE** position.

TIME 2 can also be 'synced' to **TIME 1** by setting the attached switch to **FOLLOW 1** and putting the **TIME 2** knob into the centre 'notched' position (indicated by a dot). Both delay channel times will then match and can then be controlled simultaneously by adjusting the **TIME 1** knob. Adjustment of **TIME 2** when in this 'follow' mode will offset the delay time of the right channel either shorter (-) or longer (+) than **Time 1**. Some incredibly long and filthy delay times can be achieved by doing this, it gets pretty crunchy down there but maybe you want that, you can always add some low-pass filter to clean it up a bit.

The **FEEDBACK** control works in the usual way going from 1 repeat up to infinite feedback. The attached switch will swap between **PARALLEL** and **PING-PONG**, inverting the left and right feedback loops around the delays.

The tiny hole to the right of the **TIME 2** knob is for calibrating the alignment of the two delays when **TIME 2** is in the 'notched' centre position and the switch is set to **FOLLOW 1**. Turn **TIME 1** fully to the right on the slowest delay time, insert a mini screwdriver into the hole and adjust until the two delays are in perfect sync.

MODULATION



First we have a switch to select the overall modulation **TYPE**, choose between SINE or SAWTOOTH.

Next is the **DELAY** modulation knob. This controls the amount of *pitch* modulation of the delayed signal.

Next to this knob is a switch that sets the left and right channels to either modulate in phase (**SYNC L+R**) or out of phase (**INVERT**), see below.

SINE WAVE MODULATION IN SYNC

SINE WAVE MODULATION INVERTED

SAW TOOTH WAVE MODULATION IN SYNC

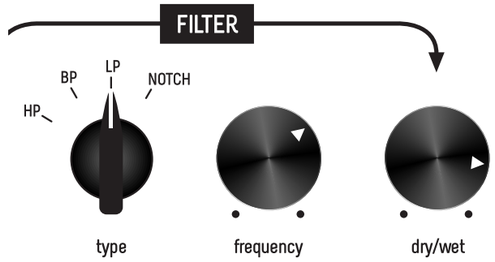
SAW TOOTH WAVE MODULATION INVERTED

Next is the **FILTER** modulation amount. This works in a similar way to the **DELAY** modulation but controls the filter modulation. It also has a switch to allow the left and right channels to be either in phase (**SYNC L+R**) or out of phase (**INVERT**).

Next is the modulation **SPEED** control. It controls the overall speed of all internal modulation. It can run from super-slow to very fast. The addition of a **x10** switch allows you to set the modulation up to 'oscillator' speeds which allows for some extreme ring-modulated type sounds. Above this control is a yellow **LED** that flashes in time with the modulation speed.

There is also a Modulation Input jack socket on the back panel that allows you to control the modulation using an external source. Simply plug a 1/8th" jack into the back and feed it +-5v from your favourite modulation source... Learn more in the HINTS & TIPS section.

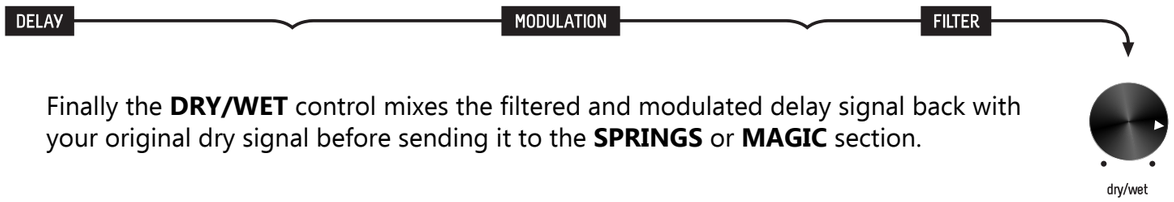
FILTERS



The four position filter **TYPE** switch allows you to quickly choose between **HIGH PASS**, **BAND PASS,LOW PASS** and **NOTCH** filters.

The **FREQUENCY** knob controls the frequency cut-off point of the four different filters.

QUICK TIP - To effectively bypass the filters, put it in **HIGH PASS** mode and turn the **FREQUENCY** knob all the way down to the left.



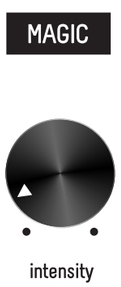
Finally the **DRY/WET** control mixes the filtered and modulated delay signal back with your original dry signal before sending it to the **SPRINGS** or **MAGIC** section.

SPRINGS

Only one control here. It controls the amount of gloriously authentic stereo spring reverb that is added to the mix.

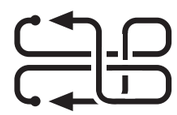
The two spring reverb tanks contain pairs of large 15" isolated springs which are shock mounted onto a steel shelf. This helps eliminate feedback and noise from external vibration.

MAGIC



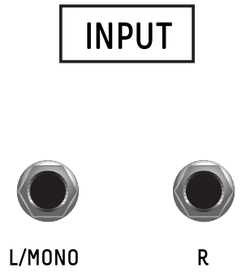
Again only one control here but it's a good one!

This controls how much of the spring reverb signal is sent back to the delays, this level is not effected by the **SPRINGS** DRY/WET control*. The channels are crossed over so the right spring is fed to the left delay and vice-versa, This allows for the sculpting of practically infinite reverb/delay tails. This control can really make the unit sing or scream depending on your other settings so maybe go easy on this at first.
You have been warned!



* *But you do need to have the Delay DRY/WET knob open a little.*
Learn more in the HINTS & TIPS

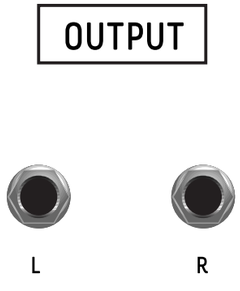
AROUND THE BACK



The line inputs are enabled when the front panel input selector switch is set to **LINE**.

They are disabled when the switch in the **GUITAR** position. If only the **L/MONO** input socket is used then that signal is sent to both channels.

To get true stereo effects plug an existing stereo signal (from a mixer or other stereo sound source) into both inputs.



To hear both delays and both springs you should connect both outputs to your amp, sound card or mixer.

NOTE!

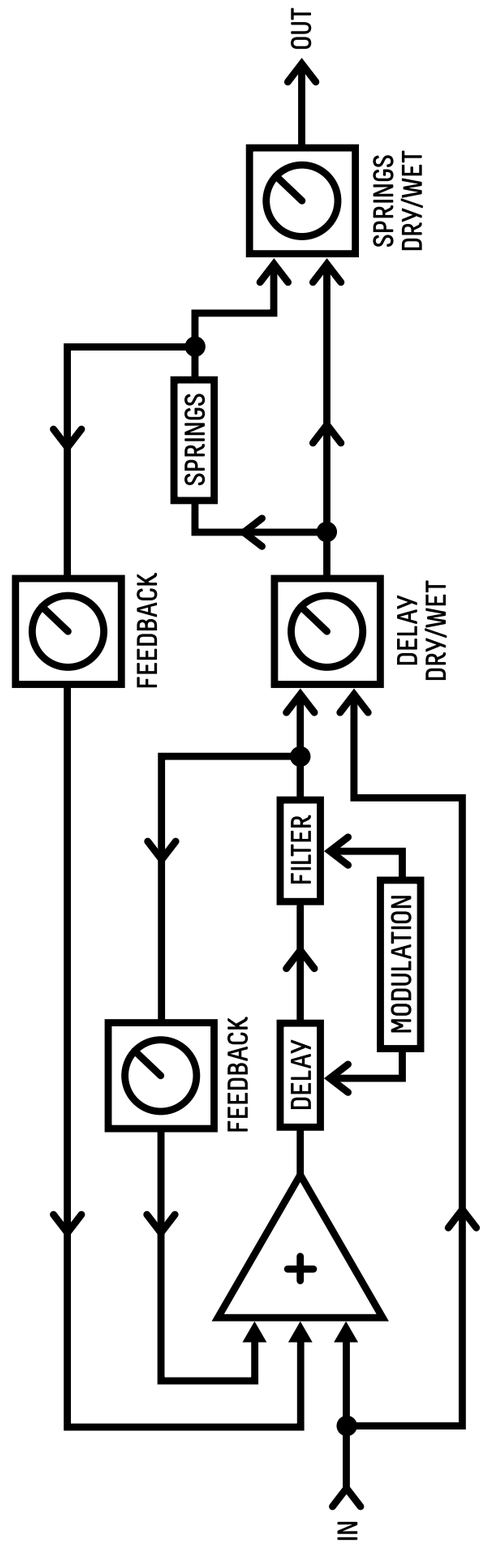
Both the **LINE** and **GUITAR** inputs are unbalanced, please use mono 1/4" Tip/Sleeve (TS) jack leads when connecting anything in to or out of the Wellspring.

Next we have an 1/8" input jack to allow external control of the unit's modulation. Feed it a +/- 5v signal from any external source. Plugging a jack in here will disable the internal modulation and replace it with your external source.

Finally, but most importantly, is the power input socket. The unit comes with it's own external power supply, tailored to the region that you're in but other models can be used. Make sure it has a minimum of 1 amp current, a voltage range between 12 and 35 volts and a positive centre pin.

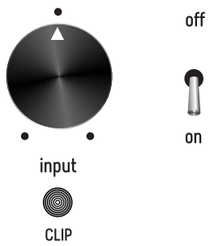
If you do use an alternative power source and the machine fails it will sadly invalidate the 5yr warranty.

SIMPLIFIED (MONO) BLOCK DIAGRAM



HINTS & TIPS

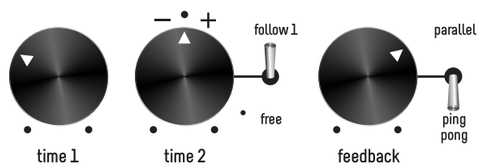
+ Always use both outputs. Pan them left and right for stereo.



+ The clip light only indicates when the input level will clip the clean ‘dry’ direct path. It’s possible to clip the delay and filter at lower levels. Clipping the input or distorting the delay won’t hurt anything.

+ Higher input levels will lower the background noise of the spring reverb and the delays, and change their tone. Keep your input level as high as you can bear it for maximum signal to noise ratio.

+ The filter is in the feedback path of the delay, so when the filter frequency is modulated, the number of echos will change organically too.



+ The left and right delay/spring reverb channels can be used independently, as long as the ‘magic feedback’ control and ‘ping pong’ mode are not used, because those controls mix together the left and right channels.

+ If you use the sawtooth modulation combined with inverse delay time modulation and just the right timing of delay and modulation rate, it’s possible to make an effect a bit like a pitch shifter...

+ Try sending some audio into the external MODULATION input, it has an interesting effect and it won’t hurt the machine.

MAGIC

MAGIC FEEDBACK

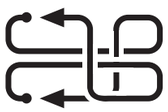
+ The magic spring feedback to the delays is an unusual feature, and will require some experimentation to get the best results.

+ The magic spring feedback control doesn’t do anything unless you can also hear the delays. This is important to remember.

+ To hear what the magic spring feedback control does, try using it while keeping the **SPRINGS** DRY/WET control in the fully anticlockwise ‘dry’ position.

NOTE WELL! The magic spring feedback is taken from the spring reverb tank outputs. As the tanks are fed from a signal after the delay DRY/WET control, increasing the delay ‘wet’ mix will also increase the spring feedback. It can scream when it wants to.

+ The magic spring reverb feedback is crossed over, so the second spring will feedback into the first delay, and vice versa.



+ The magic spring feedback often works better in combination with the ‘PARALLEL’ rather than ‘PING PONG’ delay feedback. The reason being that the feedback path is longer when only the magic spring feedback is crossed over.

KILL the RINGING

+ Using some modulation of the delay times really helps prevent the magic spring feedback’s resonant frequencies becoming too much.

+ The filter NOTCH mode is also good for cutting out resonant frequencies while using the magic spring feedback.

THANKS

Many thanks to Mike from LIFE IS UNFAIR for an incredible PCB layout. Thanks also to Gwion from HOLY ISLAND AUDIO for guiding a newbie. Thanks to THE MAGICAL MUSHROOM COMPANY for going with us. Many thanks to Steve at ABSOLUTE SIGN & PRINT for a great screenprinting job. Many thanks to Luke from BAYSIDE ENGINEERING for cutting and folding the enclosure and your patience in dealing with us. Very many thanks to all our early investors for taking a chance on us and making it all possible especially Mat Reynolds for the early faith and Leon West who hooked us up in so many ways. Extra special thanks to Sam Slater for the endorsement which means a very great deal indeed.

CREDO

As a company, we're aiming to walk a narrow path between simplicity and functionality. We want our products to be intuitive and fun to use whilst giving as much control over the sound as possible. We're musicans and engineers first and foremost. We understand your wants and needs.

THE ENVIRONMENT AGAIN

This Wellspring unit is made with care and concern for the world around us. Although we use single-use electronic components, we build to last and expect the machine to be around for at least 30 years, if not much longer. To that end we offer a 5 Year Warranty for normal use. If it fails in that time we will repair or replace it for free. After five years we can still repair it for a small fee.

MAGICAL MUSHROOM COMPANY®

Our packaging is an environmentally friendly alternative to petroleum-based polymers. Packaging is developed by Ecovative Design and exclusively licensed to the Magical Mushroom Company in the UK and European Union.

MycoCompositeTM is a high-performing material, cost-competitive with conventional expanded foam polymers, yet uses a fraction of the energy to produce, and is 100% home compostable. Simply break it up into small pieces and compost it or put it in your food waste.

The cardboard box is made from 66% recycled cardboard and is itself recyclable of course. The parcel tape is also biodegradable and the ink used for printing this manual and the packaging is non-toxic, water-based.

MADE IN WALES

www.teachingmachines.co.uk